Dougherty Valley HS Chemistry
Solutions – Calculations Part 3

Worksheet #4

Name: **Period:** **Seat#:**

Mathematical Questions

- Show plugging in the variables to the correct places in the equation
- Get an actual answer, including units! Box your answer!
- Don't forget - you must show units and any conversions that might be involved.
- You can either rearrange your equation before you plug in your variables, or after. Do what works for you!
- Some answers are provided at the end of the question. They are underlined.

1) What mass of KCl is in a 17.5% KCl solution? The total mass of the solution is 289g.

2) How much water is in the solution described above?

3) How much water would you need to add to 18.9g KNO_3 to make a 27.8% KNO_3 solution?

4) What is the NaCl concentration in a solution made with 60g NaCl and 240g water? Express your answer as a percentage.

5) What mass of KCl is in a 45% KCl solution. The total mass of the solution is 100g.

6) How much water would you need to add to 18g KNO_3 to make a 60% KNO_3 solution?

7) What is the NaCl concentration in a solution made with 45.9g NaCl and 137.9g water? Express your answer as a percentage.

8) What mass of KCl is in a 56% KCl solution. The total mass of the solution is 567g.

9) What is the NaCl concentration in a solution made with 2.66g NaCl and 260g water? Express your answer as a percentage.

10) What mass of NaCl is in a 20% NaCl solution. The total mass of the solution is 200g.

11) What mass of NaCl is in a 38% NaCl solution. The total mass of the solution is 345g.

12) What mass of NaCl is in a 77% NaCl solution. The total mass of the solution is 126g.

13) How much water is in the solution describe in #11?

14) How much water is in the solution described in #12?

15) How much water would you need to add to 28g KNO_3 to make a 50% KNO_3 solution?

16) How much water would you need to add to 35.6g KNO_3 to make a 25.5% KNO_3 solution?

17) How much water would you need to add to 15.99g KNO_3 to make a 95% KNO_3 solution?

18) What is the total mass of the solution described in #17?

19) A perchloric acid solution is composed of 168.75 g of perchloric acid and 81.25 mL of pure water. What is the % by mass of the perchloric acid solution? The density of water is 1.000 g/mL. *67.5%*

20) The density of the above perchloric acid solution is 1.138 g/mL. What is the molarity of the perchloric acid solution from question #19 ? *7.64M*

21) If 80.5 mL of the above perchloric acid solution is added to 169.5 mL of water, what is the new concentration of the perchloric acid solution? *2.46M*

22) If 43.2 mL of the diluted $HClO_4$ solution completely reacts with a 75.0 mL sample of a sodium hydroxide solution, what is the molarity of the sodium hydroxide solution? *1.41 M NaOH*

23) Use Question #22 to answer the following:

a. Write a complete ionic and a net ionic equation for the reaction in Q#22
b. What are the spectator ions in the reaction?
c. What type of reaction is this (remember the five main types)?